

Claims:

1. A process for removing BOD and suspended solids from a high volume wastewater stream comprising:
 - piping high volume, raw, unsettled wastewater directly to a deep bed filter without pretreatment in a facultative zone;
- 5 filtering the high volume, raw, unsettled wastewater by filtration through the deep bed filter;
 - backwashing the deep bed filter.
2. The process of claim 1 wherein the raw, unsettled wastewater is screened prior to piping to the deep bed filter.
- 10 3. The process of claim 1 wherein grit is removed prior to piping the raw, unsettled sewage wastewater to the deep bed filter.
4. The process of claim 1 wherein the raw unsettled wastewater is diluted prior to filtration.
5. The process of claim 1 wherein the backwash is an air/water backwash.
- 15 6. The process of claim 5 wherein the rate of air backwash is within a range of between approximately 1 cfm/sq.ft to 10 cfm/sq.ft.
7. The process of claim 5 wherein the rate of air backwash is approximately 6 cfm/sq.ft.
8. The process of claim 5 comprising the additional step of turning on the air
- 20 backwash so that the filter is bio-conditioned for aerobic activity.
9. The process of claim 5 comprising the additional step of turning on the air backwash before turning on the water backwash so that the filter is bio-conditioned for aerobic activity.
10. The process of claim 5 comprising the additional step of allowing the air
- 25 backwash to continue after the water backwash is turned off so that the filter is bio-conditioned for aerobic activity.
11. The process of claim 5 comprising the additional steps of turning on the air backwash before turning on the water backwash and allowing the air backwash to continue after the water backwash is turned off so that the filter is
- 30 bio-conditioned for aerobic activity.

Process for Direct Filtration of Wastewater

12. The process of claim 5 wherein the rate of water backwash is within a range of between approximately 3 gpm/sq.ft to 35 gpm/sq.ft.
13. The process of claim 5 wherein the rate of water backwash is approximately 6 gpm/sq.ft. to approximately 8 gpm/sq.ft.
- 5 14. The process of claim 5 wherein the length of time of the backwash is within a range of approximately 3 minutes to approximately 40 minutes.
15. The process of claim 1 further comprising the step of adding biological floc.
16. A process for removing BOD and suspended solids from a high volume wastewater stream without passing through a primary clarifier or secondary aeration tank, the process comprising:
 - 10 piping the high volume, raw sewage wastewater stream comprising soluble BOD, insoluble BOD and suspended solids directly to a deep bed granular filter comprising a filtration zone but no facultative zone, the deep bed filter further comprising bed depths within a range of approximately 2.0 ft to approximately 10.0 ft.
 - 15 filtering the raw sewage wastewater by filtration through the deep bed filter, the filter media comprising granular media with a size range between approximately 2.0 mm to 10.0 mm;
- 20 backwashing the deep bed filter at least one time every 48 hours.
17. The process of claims 16 wherein the backwash is an air/water backwash.
18. The process of claim 16 wherein the rate of water backwash is within a range of between approximately 2.5 gpmm/sq.ft to 25 gpm/sq.ft.
19. The process of claim 16 wherein the rate of air backwash is within a range 25 of between approximately 2 cfm/sq.ft to 8 cfm/sq.ft
20. The process of claim 16 wherein the time of the backwash run is within a range of approximately 3 minutes to approximately 40 minutes.
21. The process of claim 16 wherein the bed depth is within a range of approximately 4 ft to approximately 6 ft.
- 30 22. The process of claim 16 wherein the effective size of the granular media is within a range of approximately 2.0mm to 6.0mm.

Process for Direct Filtration of Wastewater

23. The process of claim 16 wherein the filtration rate is within a range of between approximately 2 gpm/sq.ft. and approximately 10 gpm/sq.ft.